

Introduction to Statistics Syllabus

MAT132 Introduction to Statistics: 4 hours, 4 credits. Collection, plotting, and comparison of data sets, histograms, descriptive statistics, the frequency definition of probability, random experiments, random sampling, binomial and normal variables, confidence intervals and tests of hypotheses for binomial and normal parameters. Time permitting, additional topics chosen from tests for the difference of proportions or populations means, the Chi Square test, and regression analysis. Introduction to a computer statistical package.

Prerequisite: MAT 104 or placement by the Department of Mathematics.

Instructor: Your instructor will provide contact information, office hours, and meeting times for your section.

Grading Policy

Expectations: Students are expected to learn both the material covered in class and the material in the textbook and other assigned reading. Completing homework is part of the learning experience. Students should review topics from prior courses as needed using old notes and books.

Homework: Approximately four hours of homework will be assigned in each lesson as well as additional review assignments over weekends. Students are required to use the Pearson MyLab™ Statistics software to complete the homework.

Examinations: There will be two midterms, and a final exam during finals week.

Grades: *Homework will be worth at least 15% of the student's overall grade and the uniform final exam will be worth at least 35% of the student's overall grade. The precise grading policy for your section will be distributed by your instructor.*

Materials, Resources, and Accommodating Disabilities

Textbook: Triola, *Elementary Statistics*, 14th edition, Pearson (Custom Lehman Edition). Students will receive purchasing information on the first day of class.

Tutoring: Departmental tutoring is available in room 233A of Gillet Hall.

Accommodating Disabilities: Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall, Room 238, phone number: 718-960-8841. email: disability.services@Lehman.cuny.edu

Course Objectives

At the end of the course students should be able to:

1. Know the difference between population and samples in an inferential study, compare and contrast different sampling methods.

2. Categorize variables as either qualitative or quantitative, and discrete or continuous.
3. Get and interpret descriptive measures of univariate data sets for both samples and populations. Also, differentiate between a parameter and a statistic.
4. Recognize correlations between data sets using scatter diagrams; express linear correlations using least squares regression; determine the strength of the correlation via the correlation coefficient; awareness of lurking variables.
5. Be familiar with and use the basic definitions and rules of probability theory.
6. Recognize the features of a binomial experiment and apply the binomial probability distribution.
7. Recognize the features of a normal distribution and compute probabilities using the standard normal distribution.
8. Infer population parameters using sampling distributions and the Central Limit Theorem.
9. Limit the error of estimation by calculating confidence intervals.
10. Accept or reject a hypothesis by establishing a level of significance.

Course Calendar

Lesson 1: Statistical and Critical Thinking (Section 1-1; pp. 3–14)

Lesson 2: Types of Data and Data Collection (Sections 1-2 and 1-3; pp. 14–36)

Lesson 3: Frequency Distributions and Histograms (Sections 2-1 and 2-2; pp. 45–61)

Lesson 4: Graphs That Enlighten and Graphs That Deceive (Section 2-3; pp. 62–73)

Lesson 5: Scatterplots, Correlation, Regression (Section 2-4; pp. 73–85)

Lesson 6: Measures of Center (Section 3-1; pp. 88–104)

Lesson 7: Measures of Variation (Section 3-2; pp. 104–121)

Lesson 8: Measures of Relative Standing and Boxplots (Section 3-3; pp. 121–141)

Lesson 9: Basic Concepts of Probability (Section 4-1; pp. 144–158)

Lesson 10: Addition Rule and Multiplication Rule (Section 4-2; pp. 158–171)

Lesson 11: Complements, Conditional Probability, and Bayes' Theorem (Section 4-3; pp. 171–180)

Lesson 12: Review for First Midterm Examination on Sections 1-1 through 4-1

Lesson 13: First Midterm Examination

Lesson 14: Probability Distributions (Section 5-1; pp. 201–218)

Lesson 15: Binomial Distributions (Section 5-2; pp. 218–232)

Lesson 16: The Standard Normal Distribution (Section 6-1; pp. 246–260)

- Lesson 17: Applications of Normal Distributions (Section 6-2; pp. 260–272)
- Lesson 18: Sampling Distributions and Estimators (Section 6-3; pp. 272–283)
- Lesson 19: The Central Limit Theorem (Section 6-4; pp. 283–293)
- Lesson 20: Normal as Approximation to Binomial (Section 6-6; pp. 303–309)
- Lesson 21: Review for Second Midterm Examination on Sections 5-1 through 6-6
- Lesson 22: Second Midterm Examination
- Lesson 23: Estimating a Population Proportion (Section 7-1; pp. 312–329)
- Lesson 24: Estimating a Population Mean and Variance (Sections 7-2 and 7-3; pp. 329–375)
- Lesson 25: Basics of Hypothesis Testing (Section 8-1; pp. 374–390)
- Lesson 26: Testing a Claim About a Proportion (Section 8-2; pp. 390–404)
- Lesson 27: Testing a Claim About a Mean (Section 8-3; pp. 404–416)
- Lesson 28: Review for Final Examination